

Incidence and Management of Rickettsial Infections among Febrile Patients Attending Inpatients and Outpatients Departments of a Tertiary Care Hospital: A Longitudinal study

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Abstract

Original Research Article

Background: Rickettsial infection can occur by a number of obligate intracellular bacteria from the genus rickettsia which belongs to the Alphaproteobacteria. Rickettsial infection is the most frequent emerging and reemerging diseases. This infection has become an endemic disease worldwide. **Aim:** The aim of the study was to find the incidence of rickettsial disease in and management of rickettsial infections among febrile patients attending inpatients and outpatients department of a tertiary care hospital. **Methods:** This study was a retrospective cross-sectional study which was incidence and management of rickettsial infections among febrile patient of department of Medicine in Tairunnessa Memorial Medical College and Hospital, Gazipur, Bangladesh. The study was conducted during the period of January 2019- February 2022. The total sample size for this study was 86. **Result:** Most common age group affected was between 21-30 years accounting for 27(31.4%) of cases. Most of the patients 47(55%) were male and 39(45%) were female. 20(23.3%) patients were housewife and followed by 21(24.4%) were garment worker, 4(4.7%) were service holder and 30(34.9%) were from other occupation. All 86(100%) patients had fever and followed by generalized weakness in 39(45.3%), Headache in 24(27.9%), Cough and cold in 25(29%), Body ache in 9(10.5%), Vomiting in 8(9.3%), abdominal pain in 8(9.3%) and 18(20.9%) other complaints were also seen. CBC & ESR, Weil Felix test were done in all 86(100%) patients followed by Urine R/M/E in 54(62.8%), serum creatinine in 12(14%), USG of W/A was done in 11(12.8%), PBF in 5(5.8%), Urine C/S in 3(3.5%), S. Electrolytes in 2(2.3%) and other investigation was done in 9(10.5%) cases. Doxycycline was prescribed in all patients 86(100%) and followed by Esomeprazole to 68(79.06%), Linagliptin+Metformin to 18(20.9%), Glimipiride to 17(19.8%), Azithromycin and Domperidon to 8(9.3%), Montelukast and Pantoprazole to 7(8.1%), Rupatadine to 6(7%), Ondansetron to 4(4.7%), Tiemonium, Fexofenadin to 3(3.5%) and other treatment along with the prescribed medicines was given to 32(26.7%) patients. **Conclusion:** Rickettsial disease is inseparably associated to most urban people socio-cultural lives. But lack of health care facilities and skilled physicians, makes it difficult to diagnose rickettsial disease in febrile patients. Early diagnosis in the management of rickettsial disease is mandatory.

Keywords: Rickettsial Infections, Febrile Patients, Inpatients and Outpatients Departments.

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INTRODUCTION

Rickettsial infection can occur by a number of obligate intracellular bacteria from the genus rickettsia which belongs to the Alphaproteobacteria. Rickettsial infection is the most frequent emerging and reemerging diseases [1, 2]. This infection has become an endemic disease worldwide [3-5]. According to the Asian Union for Food and Agriculture (AUF), rickettsial diseases (RDs) are the most under recognized emerging and re-emerging diseases. This disease can be a mild self-

limiting sickness or sometimes it can be the start of an extremely serious infection due to this bacterial pathogen [6]. However, clinical manifestations of rickettsia infections may differ depending on the type of rickettsial infection and the severity of infection. Generally, common symptoms appear within 1 - 2 weeks of infection like elevated body temperature, headache, malaise, rash, nausea, and vomiting [7]. But it is difficult to establishing the etiologic diagnosis of rickettsioses and complete diagnosis usually requires

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the investigation of serum samples especially during the acute and recovering phases of illness [8]. There remains the shortage of public health care facilities or limited access to diagnostic tests in a developing country like Bangladesh. Hence, understanding the incidence of local infections is a must to target the disease, perform necessary diagnostic test for clinical diagnosis and follow-up, and treatment planning [9]. Moreover, the clinical presentation of rickettsia infections may differ with the causal agent and patient factor [10]. Also, there are lack of adequate serological diagnostic test or culture facilities which are the key hindrance to early antibiotic therapy. Studies from North Karnataka (Vijayapura and Gadag), the center of Karnataka (Shivamogga), and the southern part of rural Bangalore have reported rickettsial disease among adults and children [11-13]. Furthermore, many studies had emphasized that giving doxycycline to the patients with a mere suspicion of rickettsial disease made a clear difference in the clinical outcome within 48 hours and the outcome of the disease after treatment [14]. Hence, this study aimed to find the incidence of RDs in and management of rickettsial infections among febrile patients attending inpatients and outpatients departments of a tertiary care hospital.

Objective of the Study

The objective of this study was to find the incidence of RDs in and management of rickettsial infections among febrile patients attending inpatients and outpatients departments of a tertiary care hospital.

MATERIALS AND METHODOLOGY

This study was a retrospective cross-sectional study which was incidence and management of

rickettsial infections among febrile patient of department of Medicine in Tairunnessa Memorial Medical College and Hospital, Gazipur, Bangladesh. The study was conducted during the period of January 2019- February 2022. The total sample size for this study was 86.

Inclusion Criteria

- The patients with complaints of elevated body temperature, headache, malaise, rash, nausea, and vomiting were included.

Exclusion Criteria

- Patients with incomplete medical records were excluded.
- Cause of fever known at the time of admission.

There were a total of 839 patients with fever attending inpatients and outpatients departments. Among them 86 patients were found with rickettsial infection hence they were considered as the study patients for this study. The patients were selected by reviewing the hospital's Rickettsial infection nominal register. The quantitative variable for this study was clinical profile and outcome pattern of the study patients. The data required for the purpose of this study were age and gender of patient, clinical features, investigations and treatment methods. The ethical approval was given by the hospital authority. The course in the hospital and treatment given were recorded properly. The statistical analysis was done using the statistical tool SPSS version 21.

RESULT

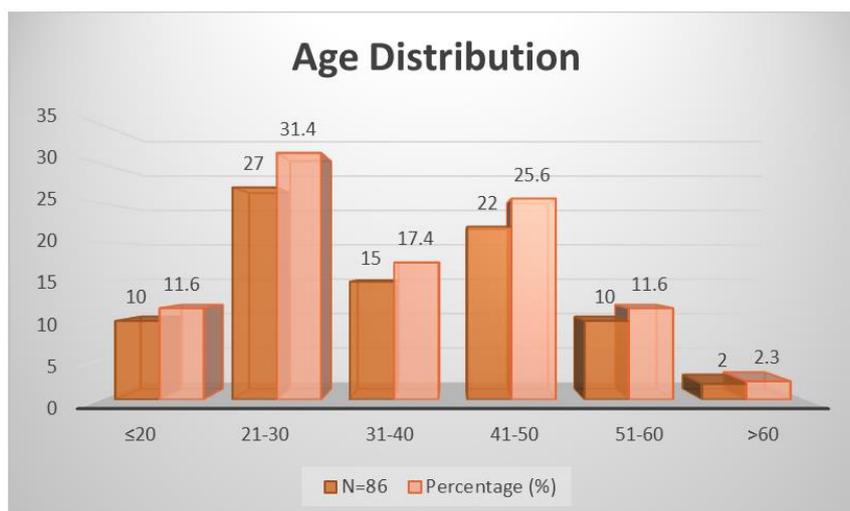


Figure I: Age Distribution of the Respondents

Figure I show the age distribution of the respondents. Most 27(31.4%) of the patients were aged 21-30 years and followed by 10(11.6%) were ≤20 years,

15(17.4%) were aged 31-40 years, 22(25.6%) were 41-50 years, 10(11.6%) were 51-60 years and only 2(2.3%) were >60 years.

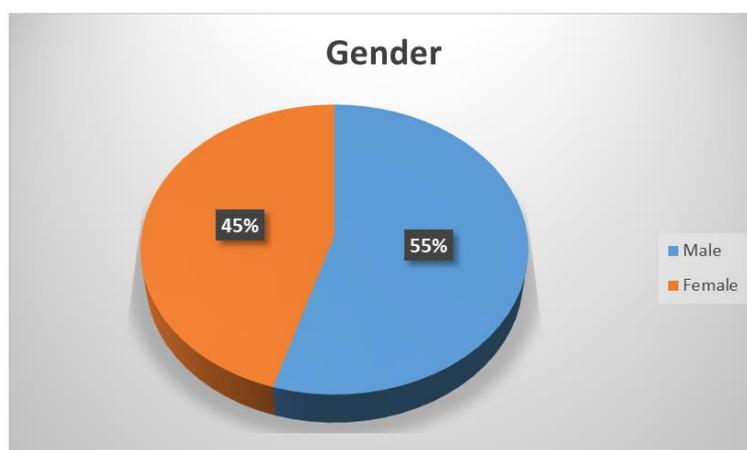


Figure II: Gender Distribution of the Respondents

Figure II shows the gender distribution of the respondents. Most of the patients 47(55%) were male and 39(45%) were female.

Table I: Occupation of the Respondents

Occupation	N=86	Percentage (%)
Housewife	20	23.3
Garment worker	21	24.4
Service holder	4	4.7
Business person	5	5.8
Student	6	7.0
Others	30	34.9

Table I denotes the occupation of the respondents. 20(23.3%) patients were housewife and followed by 21(24.4%) were garment worker, 4(4.7%)

were service holder, 5(5.8%) were business person, 6(7%) were students and 30(34.9%) were from other occupation.

Table II: Symptoms and Clinical Findings of the Respondents

Chief complaints	N=86	Percentage (%)
Fever	86	100.0
Generalized weakness	39	45.3
Headache	24	27.9
Cough and cold	25	29.0
Body ache	9	10.5
Vomiting	8	9.3
Abdominal Pain	8	9.3
Per nasal watery discharge	10	12.0
Rash	6	7.0
Nausea	5	5.8
Anorexia	1	1.2
others	18	20.9
Clinical Examination		
Hepatomegaly	48	55.8
Lymphadenopathy	20	23.3
Splenomegaly	3	3.5

Table II shows the symptoms and clinical findings of the respondents. All 86(100%) patients had fever and followed by generalized weakness in 39(45.3%), Headache in 24(27.9%), Cough and cold in 25(29%), Body ache in 9(10.5%), Vomiting in 8(9.3%), abdominal pain in 8(9.3%), Per nasal watery discharge

in 10(12%), Rash in 6(7%), Nausea in 5(5.8%), Anorexia in 1(1.2%) and 18(20.9%) other symptoms were also seen. Clinical examination revealed Hepatomegaly in 48(55.8%) cases and followed by Lymphadenopathy in 20(23.3%) cases and Splenomegaly in 3(3.5%) cases.

Table III: Significant Comorbidities of the Respondents

Significant Comorbidities	N=86	Percentage (%)
DM	15	17.4
HTN	2	2.3
DM+ HTN	1	1.2
bronchial asthma	1	1.2
Iron deficiency anaemia	1	1.2

Table III shows the significant comorbidities of the respondents. DM was seen in 15(17.4%) patients and followed by HTN in 2(1.2%), DM+ HTN,

bronchial asthma and Iron deficiency anaemia were seen only in 1(1.2%) case.

Table IV: Significant Past History of the Respondents

Significant past history	N=86	Percentage (%)
Enteric fever	7	8.1
Travel history & hiking	3	3.5
UTI	3	3.5
RTI	2	2.3

Table IV shows the significant past history of the respondents. 7(8.1%) had Enteric fever, 3(3.5%)

had travel history & hiking, 3(3.5%) had UTI and 2(2.3%) had RTI.

Table V: Investigation Done on the Respondents

Investigation	N=86	Percentage (%)
CBC & ESR	86	100
Weil Felix test	86	100
Urine R/M/E	54	62.8
Serum creatinine	12	14.0
USG of W/A	11	12.8
CRP	14	16.3
PBF	5	5.8
Urine C/S	3	3.5
S. Electrolytes	2	2.3
Others	9	10.5

Table V shows the investigation done on the respondents. CBC & ESR and Weil Felix test were the most common 86(100%) investigation among the patients, Urine R/M/E in 54(62.8%), serum creatinine in

12(14%), USG of W/A in 11(12.8%), CRP in 14(16.3%), PBF in 5(5.8%), Urine C/S in 3(3.5%), S. Electrolytes in 2(2.3%) and other investigation was done in 9(10.5%) cases.

Table VI: Treatment Given to the Respondents

Treatment	N=86	Percentage (%)
Doxycycline	86	100
Paracetamol	86	100
Esomeprazole	68	79.06
Linagliptin+Metformin	18	20.9
Glimipiride	17	19.8
Azithromycin	8	9.3
Domperidon	8	9.3
Montelukast	7	8.1
Pantoprazole	7	8.1
Rupatadine	6	7.0
Ondansetron	4	4.7
Tiemonium	3	3.5
Fexofenadin	3	3.5
Others	32	26.7

Table VI shows the treatment given to the respondents. Doxycycline and Paracetamol were prescribed to all patients 86(100%) and followed by Esomeprazole to 68(79.06%), Linagliptin+Metformin to 18(20.9%), Glimipiride to 17(19.8%), Azithromycin and Domperidon to 8(9.3%), Montelukast and Pantoprazole to 7(8.1%), Rupatadine to 6(7%), Ondansetron to 4(4.7%), Tiemonium, Fexofenadin to 3(3.5%) and other treatment along with the prescribed medicines was given to 32(26.7%) patients. Authors studied the response of Doxycycline which showed 80(93.02%) cases improved within 48 hours of start of treatment. Remaining 6(7%) cases showed delayed response due to late presentation.

DISCUSSION

Rickettsial infections now have become a global health problem as reported from different studies. Severity of rickettsial diseases may vary from self-limited mild illnesses to fulminating life threatening infections [1, 2, 15]. But due to the overwhelming bacterial and viral infections and parasitic infestations, rickettsial diseases seem to be underdiagnosed most of the time [1, 2, 15, 16]. In this present study, most 31.4% of the patients were aged 21-30 years and followed by 11.6% were ≤ 20 years, 17.4% were aged 31-40 years, 25.6% were 41-50 years, 11.6% were 51-60 years and only 2.3% were >60 years (Figure I). Sivasankari S *et al.*, in their study reported the majority patients were male and aged 30 to 45 years [17]. Most of the patients 55% were male and 45% were female (Figure II). Tabeen Mansoor *et al.*, in their study found 61.6% male and 38.4% female [18]. 23.3% patients were housewife and followed by 24.4% were garment worker, 4.7% were service holder, 5.8% were business person, 7% were students and 34.9% were from other occupation (Table I). All 100% patients had fever and followed by generalized weakness in 45.3%, Headache in 27.9%, Cough and cold in 29%, Body ache in 10.5%, Vomiting in 8(9.3%), abdominal pain in 8(9.3%), Per nasal watery discharge in 12%, Rash in 7%, Nausea in 5.8%, Anorexia in 1.2% and 20.9% other symptoms were also seen. Clinical examination revealed Hepatomegaly in 55.8% cases and followed by Lymphadenopathy in 23.3% cases and Splenomegaly in 3.5% cases (Table II). The most common clinical manifestations in our study (fever, headache, and nausea, vomiting) have been reported in other studies [19, 20]. Malleth K, *et al.*, also reported fever was the most common symptom present among the patients who were included in the study followed by rash in 57% cases [21]. DM was seen in 17.4% patients and followed by HTN in 1.2%, DM+ HTN, bronchial asthma and iron deficiency anaemia were seen only in 1.2% case (Table III) 8.1% had Enteric fever, 3.5% had travel history & hiking, 3.5% had UTI and 2.3% had RTI (Table IV). CBC, ESR and Weil Felix test were the most common investigation among all the 100% patients, Urine R/M/E in 62.8%, serum creatinine in

14%, USG of W/A in 12.8%, CRP in 16.3%, PBF in 5.8%, Urine C/S in 3.5%, S. Electrolytes in 2.3% and other investigation was done in 10.5% cases (Table V). The diagnosis of Rickettsia fever is made using serologic testing. Though Rickettsial DNA-PCR and immunofluorescence assay is the confirmatory test but due to their non-availability and expensiveness in a resource limited setting like Bangladesh, Weil Felix test is a cheaper alternative [22]. Hence, Weil Felix test was used in this study and a titre of 1:80 was considered to be positive. Doxycycline and Paracetamol were prescribed to all patients 100% and followed by Esomeprazole to 79.06%, Linagliptin+Metformin to 20.9%, Glimipiride to 19.8%, Azithromycin and Domperidon to 9.3%, Montelukast and Pantoprazole to 8.1%, Rupatadine to 7%, Ondansetron to 4.7%, Tiemonium and Fexofenadin to 3.5% and other treatment along with the prescribed medicines was given to 26.7% patients. Authors studied the response of Doxycycline which showed 93.02% cases improved within 48 hours of start of treatment. Remaining 7% cases showed delayed response due to late presentation (Table VI). Lokida *et al.*, reported antibiotics were taken prior to hospitalization by 23 patients which includes amoxicillin 8, cephadroxil 4, cotrimoxazole 3, chloramphenicol 2, cefixime 1, spiramycin 1, and a combination of antibiotics 4. Antibiotics were prescribed to 84% patients after investigating properly. The majority was prescribed ceftriaxone 17, ciprofloxacin 9 and levofloxacin 9 and a combination of antibiotics with other related treatment were prescribed to 30 patients [23].

LIMITATION

Limitation of this study was diagnosis of rickettsial fever was made by Weil Felix test (serological test) but confirmatory test were not conducted.

CONCLUSION

Rickettsial disease is inseparably associated to most urban people socio-cultural lives. But lack of health care facilities and skilled physicians, makes it difficult to diagnose rickettsial disease in febrile patients. Early diagnosis in the management of rickettsial disease is necessary. The CBC, ESR and Weil Felix test were the most common investigation which showed successful outcome. Hence, this study emphasized the importance of including rickettsioses in the differential diagnosis for fever among hospitalized patients. Besides, developing laboratory capacity and point of care test to rapidly and exactly diagnose rickettsioses, and implementing community based policy to reduce disease burden is also required. Moreover, therapeutic outcomes of doxycycline, and every socio-demographic characteristics is related with severity of rickettsial diseases. For this reason, treatment should be initiated as soon as clinical suspicion is made. This can prevent complications and

results in rapid recovery of the patients by reducing morbidity and mortality.

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